

# MONTANA

## *Wildlife*

January 1958—Montana Fish and Game Department Official Publication





AFTER AUTUMN'S GAUDY DRESS, THE QUIET CLOAK OF WINTER.



# MONTANA FISH AND GAME DEPARTMENT

Official



Publication

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# *Montana Wildlife*

Vernon Craig, Editor

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## *As The Twig Is Bent*

Guest Editorial—By Clifton Merritt

A young father of a son, aged seven, spoke proudly one evening of the fact that each year his rod and gun club sponsored a kids' fishing derby. As though assured I would agree, he asked if I didn't think it was quite a worthwhile project for his club to undertake—teaching the youngsters a clean, outdoor sport.

I was disappointed because, from any way I looked at it, I had to tell him his club couldn't have thought of a worse way to try to teach a bunch of kids to play the game fairly and be real sports.

Of course, he was temporarily offended by my remarks. And so, perhaps will be several readers who have worked hard at one time or another to make a kids' fishing derby a success.

But let's consider the situation.

What real and intangible values had the father placed on outdoor recreation? What worthwhile traits could his son, for example, acquire from a fishing derby?

Standing elbow to elbow with the rest of the kids around the pond, the boy would soon be forced to disregard some of his neighbors' rights. Kids would get in each other's way. Lines would cross and snarl. Tempers would flare. Excitement would run high. And everyone would be working like mad, some by fair

means and some by foul, to haul out the biggest fish and claim the prize money or other material reward.

Parents would be there to direct the youngsters, assuredly. But even with a parent by each young hopeful's side, all the participants, all the grown-ups, all the distractions would make it impossible to observe fully each child and give him effective instruction in the proper handling of rod and line, not to mention teaching him to live up to the rules of the game. The young fisherman, seeing his competitor gaining advantage by an unsportsman-like act, would be severely tempted.

None of the artificial conditions would compare to those of angling for wild fish in natural habitat. The father would have little opportunity to instill in his son the ideals of good sportsmanship and a love of the outdoors. There would be no chance to teach the youngsters, from surrounding examples, some of the simple inter-relationships of nature. Yet, isn't it true that this lad and the millions of young Americans like him are the future managers of our natural resources? From a fish derby they can learn only greed, wastefulness, and disregard of their fellow man. Why should the largest fish bring a monetary reward? A nice, trout, fairly caught, is a prize in itself.

As the father of the seven-year-old boy and I talked, I felt he was beginning to see the issue from another light. His concluding remarks, however, left grave concern in my mind as to the depths to which the quality of outdoor recreation is apt to decline unless many American parents bestir themselves from their apathy and indolence.

I had suggested that we discuss the matter further the following week, since it was getting late and I had promised to take my young nephew on a fishing trip early next morning to a high mountain lake on the Swan Range.

"Say, what road do you take to get into that area?", he perked up interested.

I told him the road ended at the edge of the alpine area, and that we would walk four miles by trail over the mountain and down to this

beautiful lake, where I had previously seen some large trout rising.

"What?" he breathed, incredulously. "You'd hike that far just to fish? Brother, you must like to walk! There oughta be a road."

I left him then, but not without disturbed thoughts about the future of Montana's natural assets, including trout fishing.

Just what was his idea of quality outdoor recreation, I wondered. Were there many other fathers, like him, training their sons for a sport of dubious value? A synthetic type of recreation that, because of parental sloth and neglect, may be all that's left of tomorrow's outdoor heritage? A hasty motor trip, perhaps, behind a fish hatchery truck along a beer-can bordered highway to a muddy creek where the trout are dumped by the driver and retrieved by the "fisherman" moments later?





## *A Turkey Season In Montana?*

By B. J. Rose, Game Biologist

The rancher closes his gate, pauses for a minute and shakes his head in disbelief, then steps into his pickup and drives away. Certainly, he muses, a turkey wouldn't wander this far from the barnyard.

But the strange noises, foreign to Montana forests, could easily be the gobbling of wild turkeys for, to date, seven releases of Merriam's wild turkeys have been made in the central and eastern parts of the state. During the winter of 1954-55, introductions were made in the Judith Mountains near Lewistown and the Longpine Hills near Ekalaka. Last winter releases were made in the Beaver Creek area near Ashland, the Sarpy Creek Hills south of Hysham, and the Ft. Peck Game Range south of Malta.

Two transplants have recently been made during October and November of 1957. One release was made on Indian Creek, northwest of Jordan, and one in the Knowlton area between Miles City and Baker.

The ancestral range of Merriam's wild turkey extended through the Ponderosa Pine-Oak forests of central Colorado, southward through New Mexico and Arizona to the U.S.-Mexico border. At least two states, Wyoming and South Dakota, outside the ancestral range, have made successful introductions of this subspecies.

As the result of a trapping and transplanting program, Wyoming had enough turkeys to warrant an open season on a permit basis in 1955, twenty years after the initial introduction of 1935. South Dakota, during 1948, released Merriam's wild turkeys in the Black Hills. They were spread through the Black Hills area by trapping and transplanting, and in 1954, only six and one-half years after the first release, were hunted on a permit basis.

Encouraged by the success of turkeys in these two adjoining states, the Montana Fish and Game Department undertook a wild turkey pro-



gram. Turkeys for the Judith Mountains and Longpine Hills plants of 1954-55 were obtained from Colorado and Wyoming. A careful study of these two flocks, conducted by B. J. Rose, since their release has disclosed many interesting facts about the turkeys, largest North American game bird.

**GENERAL DESCRIPTION** — Merriam's wild turkey resembles its domestic relative, but weighs less, is more streamlined in body form, and presents a less clumsy appearance. Both possess white markings on the wings and tail.

During the trapping and transplanting program, 86 turkeys were weighed in the Longpines. Only one mature tom was captured. The weights were as follows:

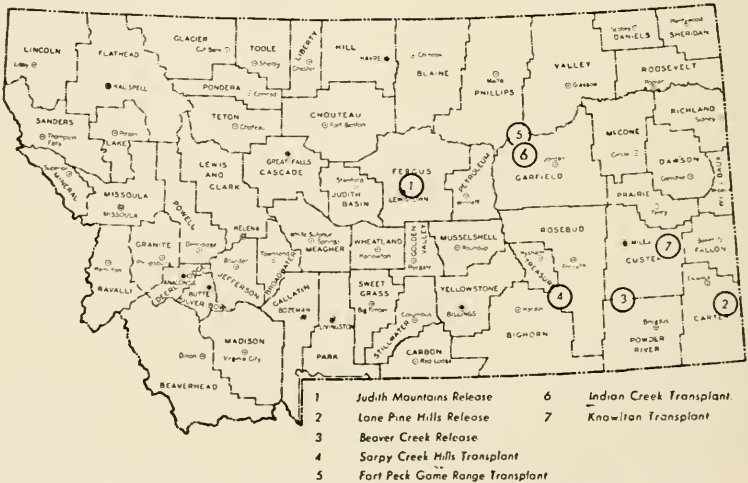
	Maximum	Minimum	Average
Adult Toms	18¾		
Juvenile Toms	18¾	9½	12¼
Mature Hens	12½	8½	10¼
Juvenile Hens	11½	7	8½

### MOVEMENTS AND ROOSTING

During the summer months, wild turkeys are found in the forested areas at the higher elevations. Here, they feed upon insects, berries, and grass heads. In the fall, however, there is a general movement to lower country. Grain stubble fields scattered around the periphery of the hills are visited at this time and it appears that waste grain, at least in Montana, replaces insects in the fall and winter diet. There are no known instances of turkeys utilizing grain fields during summer months, the time when crops could be damaged.

The daily summer cruising range was determined by continuous observation, to be about two to three miles. The winter range was about the same; however, during periods of deep snow the distance may be about one-fourth mile from the roost.

Wild turkeys fly into the trees to roost about sunset where they remain until daybreak. The larger



Releases of Merriam's wild turkeys in Montana as of November, 1957.





A clutch of 10 turkey eggs.

—Photo by B. J. Rose

trees are selected, usually at the head of a gulch or on a hillside. Small flocks may use a single roost tree, but the larger flocks utilize a group of adjacent trees as a roosting area.

**BREEDING AND NESTING**—Gobbling of toms may be heard at any time during the year. The first strutting by adult toms was observed in February; however, the displaying and breeding peak is not reached until April. Early morning hours appear to be the best time to observe strutting males.

Hens begin laying eggs after mid-April in nests built upon the ground. The average clutch contains ten eggs and requires 28 days incubation. In Montana, hatching occurs primarily during the first two weeks of June and one brood per year is raised.

**FOOD HABITS**—During the study, over 2,000 droppings were analyzed to determine the turkey's general food habits in Montana.

The main food item during summer was insects, with grasshoppers representing the bulk. Next in importance were the fruits of bearberry, snowberry, and skunkbrush, the leaves and heads of grasses, and the fruits of chokecherry.

The principal food item during the winter was grain, including wheat, oats, barley and corn. Most of the grain taken is waste found in stubble fields and around livestock feeding areas. Fruits of hawthorn, snowberry, and grassheads were next in importance.

**REPRODUCTIVE SUCCESS**—One year after the initial release of 13 turkeys in the Judith Mountains, only seven could be found. Three of these seven were juvenile birds, and evidence indicates a net loss of six birds (46%) for the first year. During the fall of 1956, a total of 44 turkeys was found. This is a substantial increase over the previous year's count and gives a net increase of 31 birds, or about 240%. The 1957 fall estimate of birds for this area is 100.

The Longpines flock has exhibited a substantial increase following the release of 18 turkeys in January 1955. During January 1956, a total of 84 was located, representing a net increase of 66, or 367% during the first year. In a single day, October 7,

1956, a total of 184 was observed. It is not known how many birds were unseen, but a population estimate of 200 is believed conservative. This would indicate that the 1956 net increase was approximately 140%. For the two-year period, this represented an amazing net increase of 182 or 1,000 percent. The 1957 fall estimate for turkeys in this area places the population between 500-600.

#### PREDATION AND POACHING —

Predation does not appear to be an important limiting factor in either study area. Coyote control with 1080 has virtually eliminated this animal from both areas, and during the study no coyotes were observed. Bobcats are relatively abundant in both study areas, however only one turkey is known to have been killed by this species. One bird was reportedly killed by two eagles and one poult was killed by a domestic cat in the Judiths. These are the only known acts of predation on wild turkeys in two and one-half years of study.

There is some evidence that illegal hunting was a limiting factor in the Judith Mountains during 1955. The removal of only a few birds at such a low population level could have a serious effect on future success. Poaching is one factor that could contribute to the decline of our turkey numbers.

TRAPPING AND TRANSPLANTING—During February and March of this year, a turkey trapping and transplanting program was con-

ducted in the Longpines. Two types of traps were used—a double-end drop gate type made from fish netting to capture less wary birds, and cannon nets to capture the more wary. Three cannon nets were used to project a weighted net over birds which had been baited into range. A total of 61 turkeys was captured with the use of both types of traps.

Of the two transplants made from these trapped birds, 16 were released in the Ft. Peck Game Range and 17 in the Sarpy Creek Hills.

Eighteen birds were color-banded with bright red, white, blue, yellow and green heavy plastic leg bands. Combinations of these colors were used to mark the birds so that each could be recognized individually. These color-marked turkeys will aid in determining movements, reproductive success, survival, etc.

The remaining ten turkeys were released at the trap site after capture.

FUTURE PLANS—The department plans to use the Longpines flock as a nucleus from which turkeys will be trapped and transplanted in other areas of eastern Montana which have stands of Ponderosa Pine interspersed with open grassy parks and associated shrubs.

If the Longpines flock exhibits a reproductive success this summer, comparable to the success of preceding years, a season may be declared on wild turkeys in this area in 1958. Details of the proposed season have not as yet been worked out.

# THE MONTANA WILDLIFE FEDERATION

By Del Rush, President

The Montana Wildlife Federation is a state-wide organization that consists of sportsmen's clubs, men's clubs, archery clubs and conservation organizations. At the present time there are 114 sportsmen's clubs affiliated with the state federation. The organization is divided into five districts which correspond with the five State Fish and Game Commissioner districts. Each district elects its own officers including president, vice-president and second vice-president. These officers make up the directors of the Montana Wildlife Federation.

The main objectives of the Wildlife Federation are as follows: promotion of both adult and youth education in conservation and problems of fish and wildlife; coordination of worthwhile ideas stemming from local sportsmen's groups or conservation organizations affiliated with the Federation on problems of wildlife and fish management and legislation pertaining thereto; cooperation with the state Fish and Game Department personnel on development of state policy or new legislation in regard to fish and game matters.

In addition, the Federation is concerned with many other diversified activities—some on a national scale.

Included under the heading of education programs sponsored by the Montana Wildlife Federation are: the wildlife extension course forums



**Del Rush, President of Montana Wildlife Federation.**

handled by a cooperative setup between the University of Montana and the state Fish and Game Department; the scholarship program which is mainly for teachers at the Conservation Workshops conducted by various units of the University of Montana during the summers; financing teachers for the Conservation Caravan and participation in National Wildlife Federation week. This included an intensified dissemination of recent material dealing with problems of fish and wildlife conservation, utilizing press releases, radio programs, talks before local organizations, etc.

The scholarships are grants in aid money from the National Wildlife Federation. These monies are from the sales of Wildlife stamps. The Conservation Caravan is a ten-day tour conducted for the past several years by the Montana Conservation Council.



# WHERE'S MY PERMIT

By R. H. Turnbull

During the hunting season the Fish and Game Department receives many inquiries (and complaints) regarding the drawing for special permits: antelope, moose, sheep and goats. Perhaps an explanation of the system used to process applications and draw for permits will answer many questions and thus allay complaints.

Special permit drawings are required by state law when the number of applications exceeds permits available in a particular area. Applications are submitted to the Fish and Game office in Helena and must be postmarked not later than July 31. **Each application for antelope must be accompanied by the exchange coupon attached to the big game license.** Drawings are scheduled to begin at 9 a.m. on the weekday nearest August 15th.

When the application is received it is examined and if found to be correctly entered, a "control number" is assigned. It is then forwarded to the I.B.M. (International Business Machines) Section where a card is key-punched with name, address, Big Game license number, control number, area choice (3 for antelope only) and number in party. A listing of the cards is then prepared, proof-

read, corrected and returned to the I.B.M. Section. The cards are corrected and filed by hunting area.

In mid-August permits are drawn starting with moose, sheep and then goats. The antelope drawing usually begins at 1 p.m. and requires about four hours for completion. Taking one area at a time the cards are placed face down in a sorting machine and segregated into various pockets. A person, who is in no way connected with the Fish and Game Department, withdraws cards at random from each pocket.

The cards are then counted by a tabulating machine until a pre-determined total (quota) for each area is reached. These cards, representing the lucky applicants, are placed on file for permit issuance.

Remaining cards are filed separately and represent the group unsuccessful for first choice. In the event area quotas are not filled by the first drawing, the cards in the unsuccessful file will be sorted by second choice and processed in the same manner as the first choice drawing. This procedure is followed until three choices have been considered. No more than three choices can be considered because the I.B.M. cards

space does not allow key-punching this information in addition to other necessary data. The three choice cards apply to antelope only, since no more than one choice is allowed for moose, sheep and goats.

If permits still remain, hunters are asked to reapply, whereby permits are issued on a first come-first served basis until all quotas have been filled. The drawing is now completed in one day, but prior to installation of I.B.M. equipment this operation required several days.

Immediately after the drawing is completed, refund checks are issued to unsuccessful moose, sheep and goat applicants. All special permits are then issued. This is a big job. However, hunters may expect to receive their permits in the mail before the end of August. Cards advising

those who were unsuccessful are mailed immediately after all permits have been issued.

One can well understand that the various phases of the whole operation requires a lot of time so hunters are urged to have patience and refrain from calling about permits immediately after the drawing. Cards must be resorted and tabulated and often the information requested cannot be supplied until this phase of the job is completed.

Occasionally persons do not enter the drawings because they are of the opinion that permits will be available at the beginning of the hunting season. In most instances, especially in central Montana, all area quotas are filled in the drawings. If hunters who wish to hunt special permit animals would submit an ap-



Sportsmen attend the 1957 machine drawing for special permits.

—Photo by W. K. Thompson

plication and not wait until the season opens before attempting to get a permit, there would be far less confusion and disappointment.

Many hunters plan their trips in advance then feel very resentful toward the department if they do not get a special permit. **No** one should plan a vacation or hunting trip based upon the receipt of a moose, sheep, goat or antelope permit in **limited** areas. When drawings are necessary, some hunters are bound to be unsuccessful.

Some persons erroneously believe that applicants have a better chance of receiving a permit if they apply individually, rather than a group. This is not true. When applying in groups, the first name appearing on the application represents the group. Cards are key-punched for all applicants, but the control indicating the number in the party is key-punched in the first card only. This card is entered in the drawing, thereby giving a single entry an equal chance. It amounts to one card competing with another card.

Annually, the public is invited to attend the drawings and annually the usual complaint letters shouting "foul" are received by the department. Still, to our knowledge, only two sportsmen's groups have been represented at the drawings since the use of I.B.M. machines was initiated. The department has hoped that many sportsmen's organizations would be represented at these draw-

ings so that there would be a wider understanding and appreciation of the system.

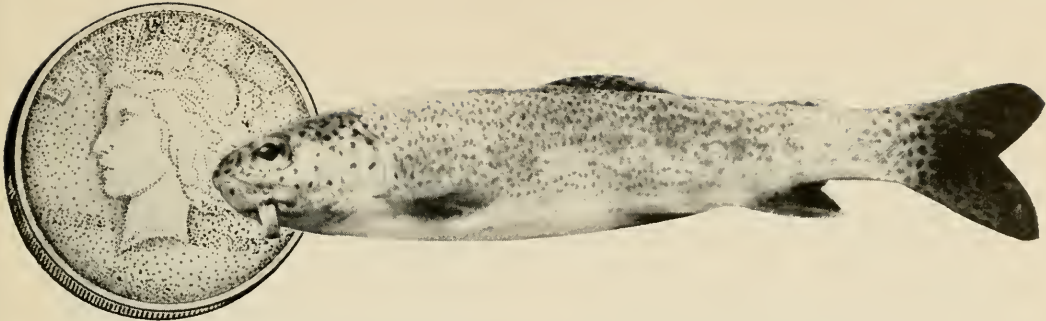
Occasionally, we get a letter from a landowner who failed to receive a permit to hunt on his own property. This seems strange and unfair to him, and his complaint may be logical; however, the law provides no preference in issuing permits. Everyone must enter the drawings and take their chances with the rest.

Some persons are especially critical of the \$20 non-resident permit system. In the past, residents have not hunted eastern Montana heavily enough to hold down antelope numbers. As a result, antelope herds over-ran certain areas and local agriculturists demanded action. Under the \$20.00 permit system, the situation has been improved so that \$20.00 antelope permits are now issued only on a limited number in most areas but not until residents have been given ample time to apply. No \$20.00 non-resident permits are issued for areas where residents apply in sufficient numbers to fill the quotas.

At present the special permit system has proven the best method for harvesting limited numbers of game animals. With the continued cooperation of sportsmen and landowners, it will serve as a most useful tool in the management of big game.

\* \* \*





## YOUR DOLLAR'S WORTH OF FISHING

By Jack Bailey, Hatchery Biologist

When the fisherman lays out hard cash for a fishing license, he expects to get his money's worth. In turn, the fisheries workers do their best to see he gets the most for his dollar. But the job of maintaining a good sports fishery in the face of greater fishing pressure and diminishing trout waters is not a simple nor inexpensive one.

The planting of catchable size trout to increase fishing success in waters where fishing pressure is exceptionally heavy has become a common practice for most states. But the expense involved in rearing these large fish is considerable; for example, the Montana trout hatchery feed bill alone amounts to approximately \$70,000 annually\*. Most of this goes to produce over one-half million catchable size rainbow trout each year.

If the license dollars are to be stretched to the limit, the obligation of the fish-culturist does not end when he plants these trout into appropriate streams. What good is

done if the fish do not live to be caught?

No more than five years ago available information on survival of hatchery-reared trout indicated that nearly all of those planted in streams would not live through the first winter. Thus, fishermen would presumably have only one season at best in which to catch them. It was suspected by many that some factor in the hatcheries such as poor diets, lack of sufficient exercise or lack of psychological conditioning to stream life might be blamed.

During the past four years a study has been conducted on Flint Creek, Granite County, to compare the survival of wild trout to hatchery rainbow.

First, a one-mile section of the stream was enclosed between fish barriers. Then all wild and hatchery reared trout within the study area were marked with serially numbered jaw tags. The entire experimental section was closed to fishing and beaver were kept out of the area.

\*Cost of feed represents approximately forty percent of the total cost of rearing catchable-sized trout.

Land owners in the valley and the Montana Power Company were especially cooperative in allowing access to the stream and in manipulating water flows to minimize danger of washing out the fish barriers. All in all, fish were pretty well confined to the desired area.

Each spring and fall the entire study area was worked with an electric shocker in order to determine which fish were still living. Their life histories in Flint Creek have been interpreted in terms of growth, condition, movement and survival.

Survival from planting in mid-summer to the following spring has generally varied from 40 percent to 70 percent in Flint Creek (depending on experimental treatment) for both hatchery and wild trout. The usual numbers of fish expected to live through the winter is about 60 percent of the total population with the wild trout often having the edge on hatchery fish. This information in itself was enough to warrant a re-evaluation of fish stocking policies. It is obvious that one plant of such trout could contribute to more than one fishing season and where conditions were suitable the trout could grow to one and one-half pounds or larger and also contribute to natural reproduction in the stream.

Figures demonstrate that the Flint Creek test stream will support approximately 420 pounds of trout per mile. To some extent, this **poundage** of fish seems to be independent of

numbers of fish. For example, when the stream was deliberately overstocked in 1955, growth rates decreased, fish became skinny and fewer wild trout grew to a catchable size. Mortality rates were slightly higher and the net tendency was actually toward a reduction in total **poundage** of fish. Thus, overstocking beyond the actual needs of a put-and-take fishery might produce good fishing so far as numbers are concerned, but the fish caught would be inferior in size and quality. Also, the potential wild fish contribution might not be utilized to its fullest.

During the 1955 tests there was one notable exception to the usually excellent survival rates. A minority of the hatchery trout planted in the test stream that year were from the Hamilton hatchery. Others planted were of the same parent source but were reared at the Anaconda station. About ten percent of the Hamilton trout planted were recaptured the following spring compared to an average 45 percent for Anaconda hatchery and wild trout. The few surviving Hamilton fish were in very poor condition. Had they been planted in the usual put-and-take type of waters it is probable that they would have contributed virtually nothing to the creel after the first few weeks in the stream. Here then, was an example formerly considered by many professional fisheries workers as the inevitable fate of all hatchery trout.



One of the fish weirs used to block off the Flint Creek study area. The enclosure is heated to prevent winter ice damage to weir.

—Photo by Jack Bailey

The two most likely reasons for their low survival were thought to be: (1) the longer time spent in the fish tank because of the greater distance from the test stream and, (2) differences in hatchery diets.

In 1956 an experiment was undertaken to test the validity of the time in tanks theory. Trout from the Anaconda hatchery were hauled 1-, 3-, and 6 hours before they were planted in Flint Creek. Only the 6-hour trip caused a measurable deviation from the expected survival rate. The trip from Hamilton to the test stream had taken less than two hours.

Further tests were undertaken in 1957 which threw some light on the diet theory. For this experiment, three groups of trout were reared on three different diets. One group was fed a relatively expensive brand name pellet of unknown composition\*. Group two was fed a cheaper pellet of known composition prepared to contract specification for

the state hatcheries by a local milling company and the third group was reared on the standard hatchery production diet of fresh meat and dry concentrates.

During the rearing period, the two pellet diets yielded equal growth rates and conversions of food to fish. Growth rate for the meat meal mixture was slower and conversions higher. The cost of raising fish on the commercial brand pellet was approximately 30c per pound compared to 15c per pound on the contract pellet.

Unfortunately, survival of trout reared on the cheaper pellet was unexpectedly low. Results are available only from the 1957 fall census at which time roughly 75 percent of the brand name pellet and meat-meal fed fish were recaptured, while only 28 percent of the contract pellet-fed fish were found.

Although the experiment was not specifically designed to tell us why the Hamilton hatchery fish failed in Flint Creek, it has demonstrated the importance of balanced, nutritious hatchery diets. We are now attempting to fortify the cheaper pellet with proper amounts of vitamins and other biological requirements. Characteristics of certain hatcheries makes complete conversion to pellet feeds unlikely and this will be done only when there is adequate assurance of success. Further tests with the new pellets are anticipated and, if successful, the fishermen's dollars will be stretched further.

\*Name furnished by request.



# Davey Jones' Locker

is bulging with pirate fish scuttled by the fisheries division in their rehabilitation program last year. Trash fish were eradicated from fifteen lakes and ponds representing 4,500 surface acres of water when full.

Undesirable or trash fish are removed by chemical treatment to provide more space and food for game fishes, and though the initial cost of treatment and restocking may seem high, the program provides an over-all saving of the fisheries dollar both in the cost of planting in later years and in numbers of fish returned to the creel.

To insure maximum benefits, careful preparation is required in advance of the actual chemical treatment. In the top left picture, a biologist is calculating the volume of a lake from a map so the amount of toxicant can be determined.

Left side—Although airplanes are often employed, particularly to spray areas that boats cannot reach, a lot of footwork with back pumps is still required to obtain a maximum fish kill in heavy brush cover.

Lower right—Spray booms built in Fish and Game shops and attached to boats were used to distribute toxicant over deep water areas.

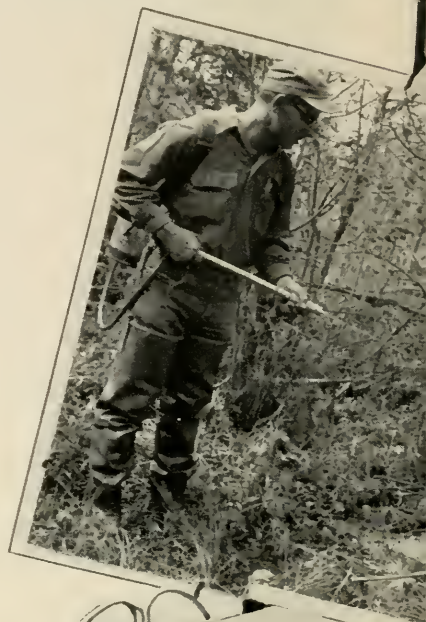
Right center—A pressure pump is shown in use on Rainbow Lake near Hot Springs, Montana to reach areas inaccessible to boats.

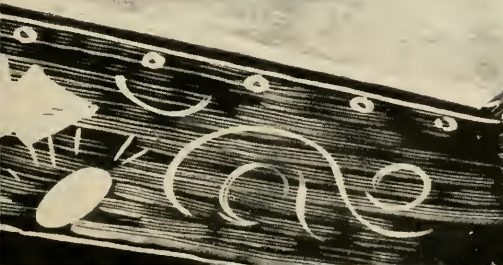
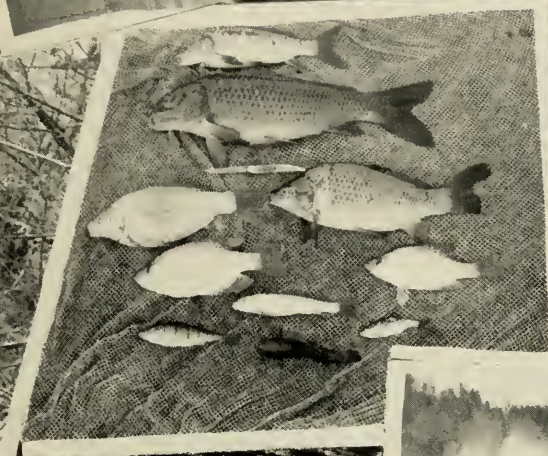
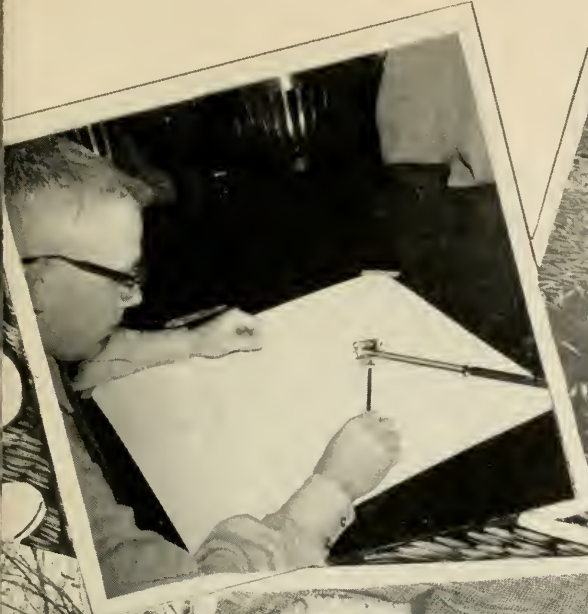
Upper right—Windrows of dead perch bear witness to the effectiveness of toxicant on Brown's Lake near Ovando, Montana, Brown's Lake which has been noted for its perch fishing was chemically treated because comparatively few perch were of desirable size.

Center—Here are fish eliminated from Tongue River Reservoir near Decker, Montana. Included are two kinds of carp, (the regular scaled, and mirror or partially scaled) goldfish, crappie, sucker, perch, bullhead, and western golden shiner. Through the cooperation of the State Water Conservation Board, this was the first large Montana reservoir purposely drawn down to dead storage to make rehabilitation of the fishery economically possible.

—Photos by George Holton

Most of this work in 1957 was undertaken with Federal Aid to Fisheries Restoration funds under D-J Project No. F-24-D.







# MONTANA DEER MANAGEMENT WHERE DO WE GO FROM HERE ?

By Glen F. Cole, State Range Biologist

This report is largely based upon the results of investigations and surveys conducted by Montana game managers and research biologists. These results have been abstracted from technical reports which are required under the Wildlife Restoration Act. On occasion, results of the research in other states, with problems similar to Montana, are the basis for conclusions.

## HARVESTS

Regulations governing Montana's deer harvests have changed rapidly in recent years. Restrictive one-deer buck seasons largely governed harvests from 1912 to 1950. From 1951 through 1954, buck seasons were replaced more and more by one-deer, either sex seasons. From 1955 through 1957, two-deer either sex seasons largely replaced one-deer seasons, except for the eastern part of the state.

To determine the number of deer harvested and the success of license holders, a questionnaire card is mailed to a sample of persons buying big game licenses each year. Results from cards returned from 1951 through 1956 are shown below:

It can be seen that progressively greater numbers of deer have been harvested from 1951 through 1956. The harvest in 1956 is about two and one-half times that in 1951. Numbers of big game licenses sold each year have also increased, but only about one-third more licenses were sold in 1956 than in 1951. The increased success of license holders appears to be the major reason for the greater harvest. In 1951 only 38 out of every 100 license holders bagged a deer. In 1955 and 1956, 77 deer were bagged for every 100 license holders. Complete information on the results of the 1957 season are

Big Game Licenses Sold		Number of Deer Harvested	Per Cent Success of License Holders
1951	101,985	39,000	38
1952	118,181	53,800	45
1953	119,591	80,000	67
1954	123,259	84,300	68
1955	129,735	100,000	77
1956	130,445	100,500	77



Biologists examine dead deer to determine cause of death. Starvation may be readily determined by fat content of bone marrow.

not yet available. Indications are, however, that the harvest was equal to or greater than the 1956 season.

The original reason for initiating either-sex deer seasons was to harvest greater numbers of deer. This was considered necessary to keep deer populations within the limits of their winter food supply. Food supplies on summer ranges are generally adequate. The consequences of not keeping deer populations within the limits of their winter food supply are wasteful losses of animals by starvation and damage to ranchers' hay stacks.

The mail-card-questionnaire returns show that greater numbers of deer were harvested as either-sex seasons replaced buck seasons. This raises the question, did these greater harvests keep the deer populations within the limits of their food supply?

Unfortunately, the answer is **NO**. Deer have continued to die from starvation, and depredations on hay stacks have continued.

### **NOT ENOUGH HUNTERS**

The primary reason, that increased harvests have failed to keep deer populations within the limits of their food supply, is that Montana simply does not have enough hunters. Even the 100,000 or so hunters in recent years appear to have little effect on present deer populations. This is somewhat understandable when we realize that we have deer spread over a 146,131 square mile area.

### **DEER DECLINES**

Since we have concluded that hunter harvests have little effect on our present deer populations, it might be assumed that deer are increasing. This, however, is not the case in the majority of the state's mountainous areas. Considerable evidence points out that deer populations in these areas are decreasing. The primary reason for this is that populations have been permitted to repeatedly overuse their food supply. The end result of repeated overuse on a food supply is a winter range which will support fewer and fewer deer through the years. The actual decrease in deer numbers is brought about by starvation and a reduction in the number of fawns born.

Another factor contributing to the decline of deer populations in some areas is the elk. Elk have increased



steadily in many of the state's mountainous areas. Deer and elk frequently use the same browse plants for food during the winter. This results in direct competition for food. As browse plants become more and more overused, deer starve. Elk are less affected since they can reach higher and paw through deeper snow than deer. In addition, where snow depths are not excessive, elk can subsist on grass.

The fact that deer populations are decreasing in mountainous areas will be viewed with alarm by some individuals. It will seem illogical to others that a shortage of winter food rather than harvests is the reason for this decline. Nevertheless, the research biologist and the game manager can only report conditions as they exist. It would seem far better to face up to the facts than evade the problem because it is unsavory.

## **THINGS TO COME**

Game management has matured into a full-fledged science in recent years. People in this profession now have enough basic information to predict what will happen under certain conditions. Based on the investigations of Montana biologists and those from other states, we may predict the following with respect to deer management in Montana.

1. Deer populations in the state's mountainous areas will continue to decrease as a result of food shortages and competition with elk.

2. Barring any marked increase in non-resident hunters, the number of hunters in the state will increase slowly. According to a recent survey, Montana is slated for only a 20 percent increase in population within the next 10 years.

3. With a substantial decrease in deer and an increase in numbers of hunters, harvests will become more effective. It may then be possible to manage deer so that overused forage plants will be permitted to recover.

4. The recovery of overused forage plants will be slow. Substantial harvests will be necessary to hold deer populations at levels where old plants will recover and new ones will become established.

5. As forage plants recover, substantial harvests will still be needed to prevent a redevelopment of the problem. With better nutrition from adequate food supplies, does will produce more fawns and starvation will no longer hold populations in check.

6. Coincident with deer decreases and increases in numbers of hunters, the success of big game license holders will decline. Instead of 77 deer being harvested for every 100 license holders, as in recent years, we would expect about 40 or 50 for every 100 in the future.

7. With lower deer populations, hunting will become more sporting. Individuals who hunt from cars or do not get any distance from roads



**Big Game biologists measure forage plants on winter range to determine the effects of deer use on forage production. Note the clubbed condition of overused browse.**

will be largely unsuccessful. Those who expend the effort will get deer, but there may be times when even the best hunter is unsuccessful.

8. Once populations are within the limit of their food supply we can expect larger and healthier deer than at present. Animals will not be stunted from food shortages and nutritional deficiencies or predisposed to various diseases.

9. As harvests bring animals within the limits of their food supply, the sex and age composition of deer populations will change. Fawns and aged deer are the first to starve on ranges where food is short. With adequate harvests, aged deer become less prevalent and the majority of the animals in a population are in

the prime and young age classes. With adequate food supplies, fawns will survive through winters and be added to the population. Since approximately one-half of each year's fawn crop are males, it can be seen that more bucks will be available to hunters when fawn crops are not lost by starvation.

10. When and if it comes to pass, that hunter harvests become effective in keeping deer within the limits of their food supply, we will be making proper use of a resource. It is entirely possible to harvest as many deer as we are now doing from a smaller breeding population. The difference is that we would be harvesting the annual crop of surplus animals from healthy productive herds instead of losing what little

production there is from herds which must contend with food shortages, nutritional deficiencies and diseases.

### **THE SOLUTION**

The obvious solution to situations where deer are overusing their food supply is to harvest more animals, but the problem is how? In the past two years, Montana has had almost general two-deer either sex seasons in all but the eastern portions of the state. Returns from statewide questionnaires show that two-deer seasons have resulted in a harvest of only 9 or 10 more deer per 100 hunters as compared to one-deer either sex seasons. This does not mean that two-deer seasons are of no value in solving local management problems. In some problem areas two-deer seasons have increased the harvest by about one-third over that obtained by one-deer either sex seasons. All information shows, however, that the majority of Montana's hunters will not harvest a second deer. This is unfortunate. Instead of utilizing surplus deer, we are permitting them to be wasted.

### **THE MANAGEMENT PLAN**

The management plan for the professional game manager calls for annual measurements of food conditions, deer population trends, and the number of animals harvested. Food conditions are measured each spring by methods which take into account the amount of use on important forage plants and the effect of this use on future forage production.

Population trends are measured by a variety of methods. Two of the most common are pellet group counts and periodic doe-fawn-ratio counts. The number of deer harvested is determined by hunter-check stations and mail-card questionnaires.

Information on food conditions, population trends, and the harvest are all evaluated in recommending the type of season needed for a particular area. Since food conditions ultimately determine the welfare of deer populations, they are given the most weight. The population trend or the number of deer harvested is of little consequence if the present number of deer on a range are overusing their food supply. This is the situation we are facing in the majority of Montana's mountainous areas.

With respect to elk competition with deer, decisions will have to be made as to which game animal is to be favored. Decisions should be based on range appraisals which would determine if greater benefits could be derived from deer or elk. If elk are to be favored, declines in deer populations must be expected. If deer are to be favored, elk populations must be reduced to levels where they would not be competing with deer for food.

The management plan for the general public and sportsmen calls for a better understanding of the problem which is basically one of food supplies. Winter ranges will produce food for just so many game animals and no more. Attempts to





Winter is the critical period for food. Too many deer for the available food results in over-used forage plants. Note damage to young evergreen.

carry more deer or elk than range will support only result in overuse on forage plants and a winter range which will carry fewer and fewer animals through the years.

### PLANNED ACTION

For the present, it is obvious that one and two-deer either sex seasons are still the best management tools for Montana's deer situation. In general, one-deer seasons will be recommended for the prairie portions of the state where food conditions are less critical. Two-deer seasons will be recommended for the mountainous portions of the state where food conditions are critical.

More specifically, the type of deer season recommended for any particular area will depend upon the re-

sults of surveys and investigations conducted by professional game managers and research biologists. Information on deer food conditions, population trends, and the numbers harvested will be the basis for recommendations. The extent to which this information is used in the final setting of seasons will determine the soundness of Montana's deer management program.

In this age of missiles and Sputniks, the use of research results and a scientific approach should be something the public demands in a deer management program. The professional game managers and research biologists are hoping that this is the case.



## MONTANA FISH & GAME DEPARTMENT ORGANIZATION

The Montana Fish and Game Department, like other growing agencies, is of necessity a flexible organization.

From time to time, as public demands grow and the need for adjustments are felt to cope with management complexities, some reorganization is needed to maintain an efficiently coordinated operation.

Following is an organization chart of the Montana Fish and Game Department as it exists today and a brief description of staff responsibilities.

The Montana **Fish and Game Commission** consists of five men selected from five commission districts. These men, appointed by the Governor for a period of four years, meet two

days of each month. Their responsibilities are primarily concerned with policy setting, budgetary problems and hunting and fishing regulations.

The Department **Director** is appointed by the Commission for an indefinite period. He is the administrative officer responsible for the operation of the entire department, and is assisted in these activities by the **Deputy Director**.

Three major divisions are responsible for the **direct** management of Montana's wildlife resources. These are the divisions of Game Management, Enforcement and Fisheries. Close cooperation and coordination must exist between the three divisions in order to insure maximum efficiency.



Standing, L-R: W. J. Everin, Deputy Director; E. J. Skibby, Commission Chairman; H. W. Black, Commissioner; R. D. Shipley, Commissioner; W. T. Sweet, Commissioner; J. T. Hanson, Sr., Commissioner. Seated, L-R: A. A. O'Claire, Director; E. Cutler, Commission Secretary.



A. A. O'Claire, Director, Montana Fish and Game Department.



W. J. Everin, Deputy Director, Montana Fish and Game Department.

### MANAGEMENT DIVISIONS

Game management activities are directed and supervised by the **Chief of Game Management**. The position of game manager is new in the Montana Fish and Game Department, even though the actual activities have existed for some time. This is a technical and administrative position responsible for the statewide game management program. Close liaison is required with the Federal

Aid Coordinator, the Chief of Law Enforcement and the District Game Managers.

The **Wildlife Projects Coordinator** is responsible for directing and supervising projects involving federal aid funds. Although these projects are financed to the extent of seventy-five percent federal funds, the state retains control and direction of all such projects. Wildlife Restoration funds are allotted to states on an area—license sales basis.



R. H. Cooney, Chief of Game Management.

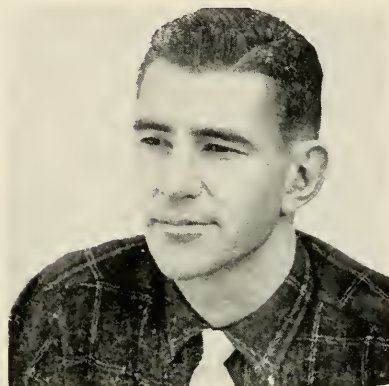


W. G. Freeman, Wildlife Projects Coordinator.

Both Biological and Fish Culture programs are supervised by the **Fisheries Superintendent**. Assisting him is the **Chief Fisheries Biologist** who directs his program through District Fisheries Biologist and the **Hatchery Superintendent**, supervisor of fish culture personnel.



W. M. Allen, Superintendent of Fisheries.



G. D. Holton, Chief Fisheries Management Biologist.

The **Chief of Law Enforcement**, besides dispatching enforcement duties, works closely with the Game



F. S. Keller, Assistant Superintendent of Fisheries.

Manager Coordinator and Fisheries Division wherever aid is required in censusing, stocking, checking stations and other management facets. Directly responsible to him are seven District Warden Supervisors.



D. L. Brown, Chief of Law Enforcement.

## SERVICE DIVISIONS

Personnel in these divisions contribute materially in various ways in the management of wildlife resources. To them falls the task of tying up loose ends and caring for the myriad of details that are necessary incidentals to actual management. Service divisions cooperate with and assist all other units of the Department.

The **Chief of Information and Education** is charged with the dissemination of news, publicity and advertising, wildlife conservation education, and general information.

The I and E Chief works closely with other divisions.

Among the other responsibilities of this division are youth programs, the hunter safety program and wildlife exhibits.

The proper dispatch and accounting of income and disbursements and general office procedure is supervised by the **Chief Clerk**. This division also supervises issuance and dispersal of licenses and permits as well as many other details relating to general administrative matters.

The Divisions of Graphic Arts, Engineering, Shops and Warehouse, and Airplane service are self-explanatory. The services of these units to other divisions are very important in the everyday functions of the Fish and Game Department.



W. K. Thompson, Chief of Information and Education.

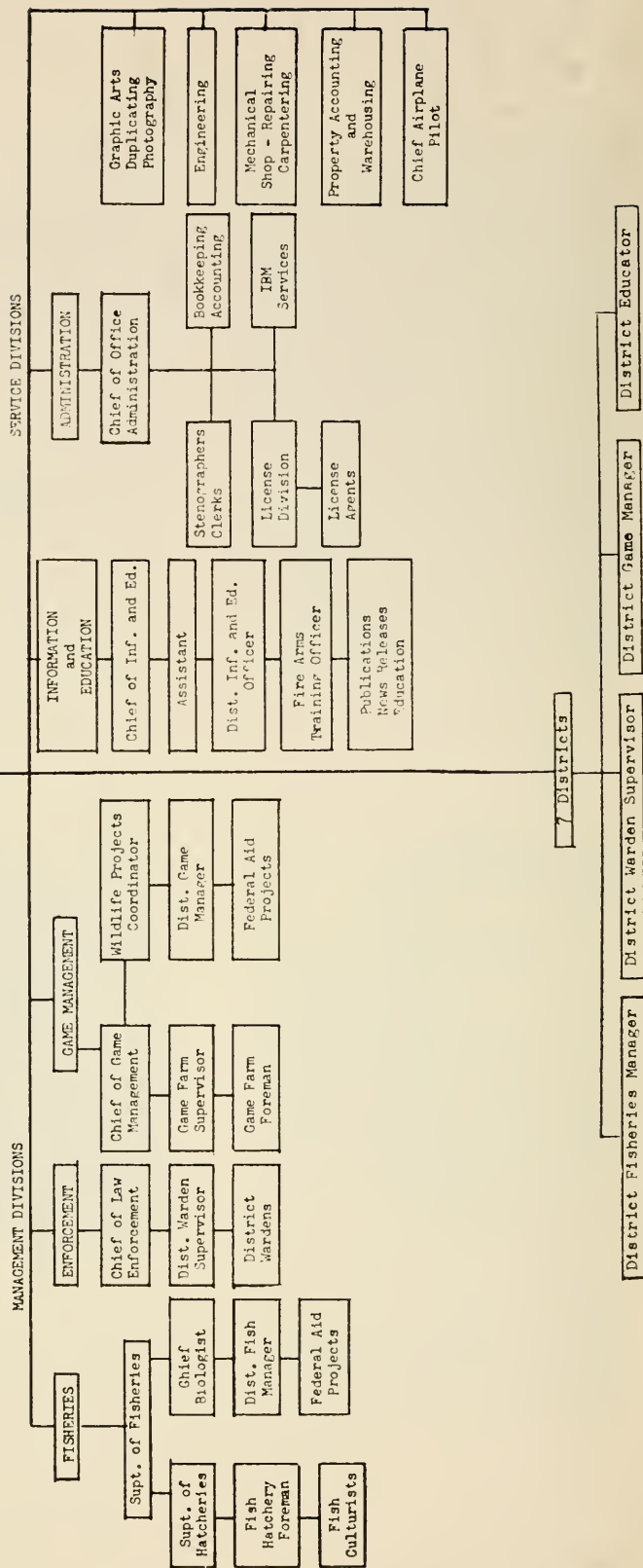


R. H. Turnbull, Chief Clerk.

NOTE ORGANIZATION CHART ON FOLLOWING PAGE



COMMISSION	DIRECTOR	DEPUTY DIRECTOR
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## *The Shining Mountains*

By V. E. Craig

The history of Montana is as colorful as the state itself, and wildlife has played an important role almost from the time when the first white man, a fur trader Chevalier De La Verendrye, set foot upon its soil on New Year's Day, 1743. Upon seeing the glistening, snow encrusted Bighorn Mountains piled in majestic grandeur he exclaimed, "This is the land of the shining mountains." To this day, this phrase is used to describe our state, "the land of the shining mountains."

Verendrye, and his party, in search of the Pacific Ocean were led into Montana by Indian tales of a great river. Upon leaving Montana, Verendrye raised a monument and planted a lead plate in the name of France. The plate, planted May 2, 1743, in a vast wilderness was discovered by a school girl 150 years later near Pierre, South Dakota.

Montana later became a war prize to England but was returned to France by Napoleon in 1800. Eventually, the area was included in the Louisiana purchase and became a part of the United States. Immediately plans were made to explore the northwest wilderness and in 1805, thirty-four men and an Indian woman guide, Sacajawea, crossed Montana under the leadership of Lewis and Clark.

Judging from the journals, game animals flourished here in great abundance in those early days. With their primitive hunting methods the few aboriginal Indians could have made but little inroads on their numbers. Countless buffalo, elk, antelope and deer ranged the grassy, wind-swept prairies and rolling foothills while the bighorn sheep inhabited more precipitous terrain

bordering rivers and badlands. Carnivores also were numerous and giant grizzlies ranged into the Dakotas.

Early explorers report comparatively little game in mountainous country, a further indication that the habits of many game animals changed as civilization made its inroads.

The lure for furs beckoned trappers and traders deeper into the vast and practically untouched northwest. Manuel Lisa was one to recognize the great potential of this wild area and in 1807-1808 established the first Montana trading post at the junction of the Yellowstone and Bighorn Rivers. During 1810 a second post was established near the three forks of the Missouri River. It was one of Lisa's men, John Colter, who first discovered Yellowstone Park while fleeing hostile Indians. The fantastic tales he told of the area were not believed, and for a long time it was referred to as Colter's Hell. As early as 1832 a fur trader (Pierre Chouteau) brought a steamboat to Fort Union near the confluence of the Missouri and Yellowstone Rivers. Gradually, the steaming smoke-belching craft replaced its predecessors — the keel boats and dugouts laboriously brought upstream by earlier pioneers.

**As the great wealth of furs began to flow from Montana, more pretentious posts were established to handle the ever-increasing products of fur trade. The town of Fort Benton**

built in 1846 by the American Fur Company to handle fur trade, became one of the more important centers of fur industry as both white and Indian trappers came to it from the wilderness to ply their wares.

Naturalists, including the well-known Audubon were lured to Montana by tales of game abundance. Many of them headquartered at Fort Union and set down in their journals records of teeming animal life. Hunters also turned from depleted game herds of the east and journeyed west where they could pursue their sport or seek fortune in hide hunting.

Perhaps the most bizarre of hunters was one Sir George Gore who left Laramie in August 1854, and entered Montana in 1855 accompanied by 41 men, four mule wagons, three ox wagons and 21 French wagons. Sir George, a so-called gentleman hunter, enjoyed luxury and his expedition carried quantities of assorted items to insure his comfort, including three milk cows and a brass bedstead. One wagon was loaded with Sir George's battery of firearms (75 rifles, over one dozen shotguns and many pistols).

Sir George reputedly never loaded his own firearms but shot his quarry, preferably buffalo, from a comfortable position and was then handed another gun by an attendant. Little use was apparently made of the animals he shot, and the bloody trail he left brought forth what seems to be the first recorded protest of wanton game slaughter in Montana. A





The search for furs brought into the wilderness a hardy and adventurous breed.

letter written to the Fort Union commander by Indian Agent A. J. Vaughn in 1856 reads in part "he states, also his men, that he killed 105 bears and some 2,000 buffalo, elk and deer 1600, he states, was more than they had any use for, having killed it purely for sport."

The exciting gold discoveries at Gold Creek, Bannack and Virginia City (1858-65) ushered in a new era of western immigration. Steamboating on the Missouri River was at a feverish pitch, with the puffers going as far upstream as Fort Benton. In 1867, 10,000 passengers were landed at Fort Benton. In 1865 the Mullen Road, first of any importance in Montana stretched from Fort Benton

across the mountains near Helena to Walla Walla, Washington, in order to accommodate the ever-increasing tide of western immigrants. Covered wagons dug deep into trails which had known only the Indian travois.

About this time, some of the more far-seeing became alarmed about the destruction of Montana's wild resources. It appears odd that their concern over fish was greater than that of the large animals succumbing to wholesale destruction. Nevertheless, the first attempt at management found its way into the territorial legislature of 1864. An enacted bill which limited the taking of fish by rod and pole, line and hook and prevented using poisonous substances

or the making of dams to catch trout went into effect February 2, 1865.

As early as 1853, Pallister wrote in his *Solitary Rambles of a Hunter* that the old time hunter and trapper were "a race now rapidly becoming extinct owing to the great fall in the price of beaver from the recent introduction of silk into the manufacturers." The use of nutria and seal further tended to reduce the beaver market. Trappers turned from the beaver and joined professional hunters in securing the more lucrative big game robes.

In 1866, the cattle industry got its start in Montana. Longhorns were trailed in from Texas to dot the range where the buffalo had recently roamed.

**According to records, T. C. Power and J. G. Baker of Fort Benton controlled the bulk of robe trade. From 1875-1877 there annually were shipped out of Ft. Benton 80,000 to 100,000 buffalo robes, about 30,000 wolf skins, 150 tons of antelops skins and other assorted small furbearer pelts. The slaughter of bison and influx of settlers agitated Indian troubles which culminated in the Custer massacre on the Little Bighorn in 1876.**

The numbers of wolf pelts shipped are further evidence that wolves were very abundant in territorial days. In the buffalo range they lived almost exclusively on the bison. Audubon, in his journals, mentions wolves feeding from pig troughs

around Fort Union and of sentries seeing many when the fort's gates were opened at sunrise. Hundreds of wolf paths led to the fort. In 1887, 1,582 wolves and 2,570 coyotes were bountied. This was the first year coyote bounties had out-numbered wolves. This act of one animal increasing to fill the niche left by a diminishing species is a common, but not well understood biological phenomenon. After taking the hides of game animals, the early settlers poisoned the carcasses to kill the wolves. Relentless warfare was waged on them by hide hunters and later stockmen until almost total extermination resulted.

In 1869, legislators again turned their thoughts to the rapidly dwindling game numbers and acted to prevent the killing of quail and partridge for a three-year period beginning July, 1870. The following year, another act concerning game birds was affected. This prevented killing grouse, prairie chickens, pheasants, fool hens, partridge or quail between the first day of March and the 15th day of August of each year.

It was not until 1872 that the larger big game animals were given consideration. This year also marked the establishment of Yellowstone Park. A season was set to protect Mountain buffalo, moose, elk, black-tailed deer (mule deer), white-tailed deer, mountain sheep, mountain goat, antelope and hare between the

**first day of February through the 15th of August. In 1876, it became unlawful to take big game animals for their hides alone. Protection was also allotted beaver, otter, marten and fish between the first day of April and the first day of October. This did not prevent landowners from removing beaver that were causing damage. Some waterfowl were also given protection between May 15 and August 10.**

Hard winters of 1881 and 1882 aggravated the plight of the buffalo and in 1883, professional hunters could not believe what they must have known would come to pass—the incredulous fact that large scale buffalo hunting had come to an end. The great herds were forever gone. So great had the slaughter been that for some years both homesteaders and Indians profited by gathering and selling the bleached bones that littered the prairies.

But the finale of the bison did not put an end to the large drain on game animals. Miners and homesteaders continued to make inroads on the larger animals, and game meat apparently supplied a bulk of food for hungry railroad crews as the steel rails stretched into the west. Though an act of 1883 was designed to prevent market hunting of any animals, it continued to be a profitable occupation for many people. Records state that even U. S. cavalry was unsuccessful in preventing regular poaching raids on remnant buffalo herds in Yellowstone Park.

During 1889, the year Montana gained statehood, legislative provisions were made authorizing creation of fish and game wardens for each county. If at least 100 county tax payers petitioned the board of county commissioners, the commissioners could, if they deemed it advisable, select a warden and pay him \$100.00 per month from county monies.

**The first board of Fish and Game Commissioners took office March 14, 1895. They proceeded to set very liberal seasons and bag limits, including 8 deer, 8 mountain sheep, 8 goats and 8 antelope per hunter in one season. There were no limits as to the numbers of grouse or waterfowl that could be taken during a lengthy season.**

On April 1, 1901, W. F. Scott was appointed as the first state fish and game warden and was given a force of eight deputies.

From this modest beginning has grown the rather complex organization we have today. Fishing and hunting has become one of Montana's most important assets. Even in the face of greatly increased demands by hunters and fishermen, and decreased wildlife habitat, hunting and fishing has continued to improve in Montana.

Sound management based on research facts together with the support of a well informed citizenry will keep this state among the nation's leaders as a hunting and fishing paradise.



Helena, Montana

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